

Future of Surface Transportation Opportunities and Challenges

presented to

Commonwealth of Virginia

Commonwealth Transportation Board

Richmond, Virginia

presented by

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Transportation leadership you can trust.

CAMBRIDGE
SYSTEMATICS
February 15, 2007

Agenda

- **System Condition and Demands**
- **Demographics**
- **Energy and Environment**
- **System Operations/Management/Safety**
- **Institutional Change**
- **Funding**

Transportation Bottom Line

**System
Conditions and
Demands**

Freight Volumes Growing Faster than Passenger; Bottlenecks Emerging

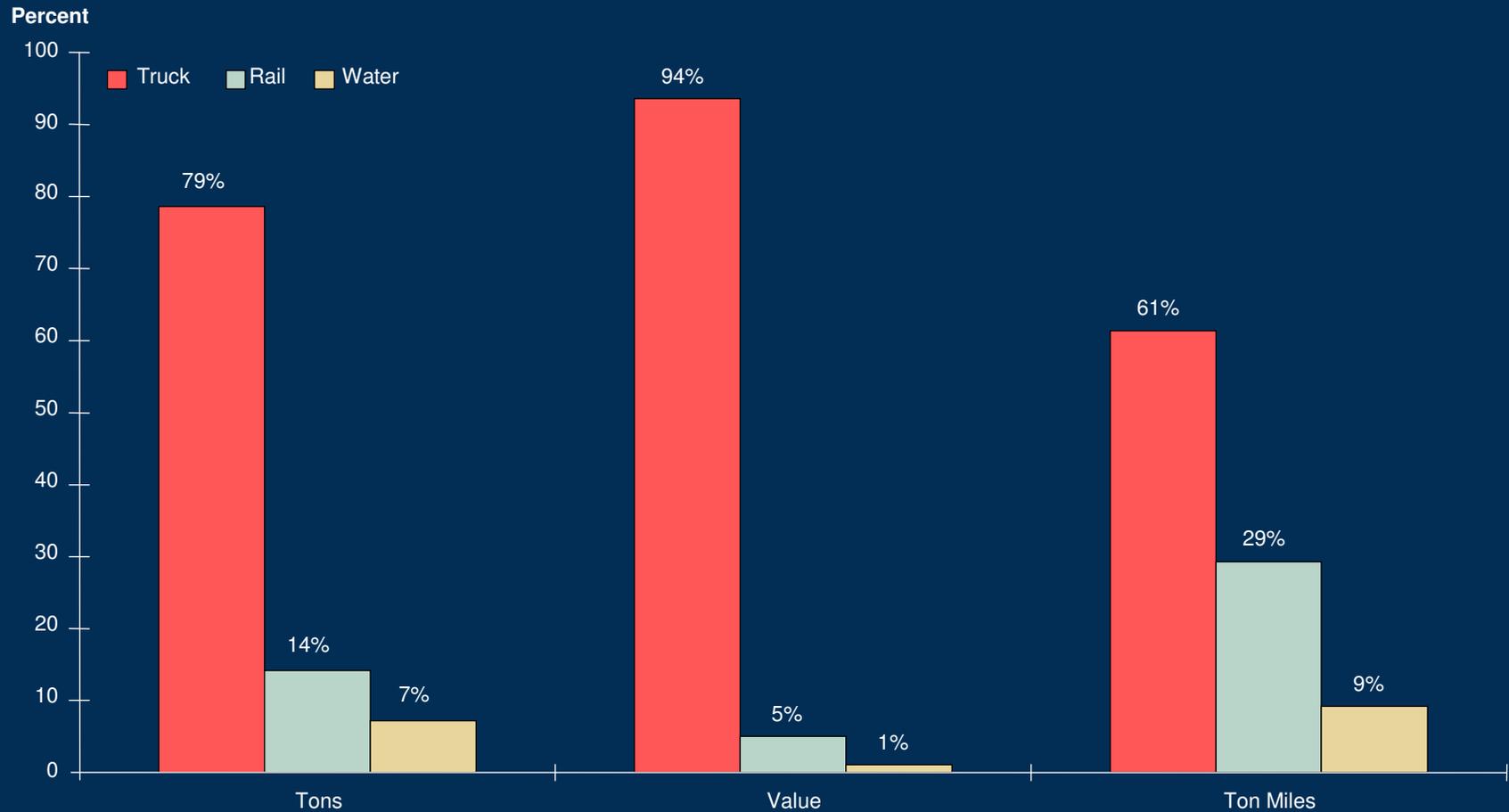


Community and Land Use Impacts

Cost/ Complexity of Expanding Marine, Rail, Truck, Air Terminals



Freight Tons, Value, and Ton-Miles, 2004 United States

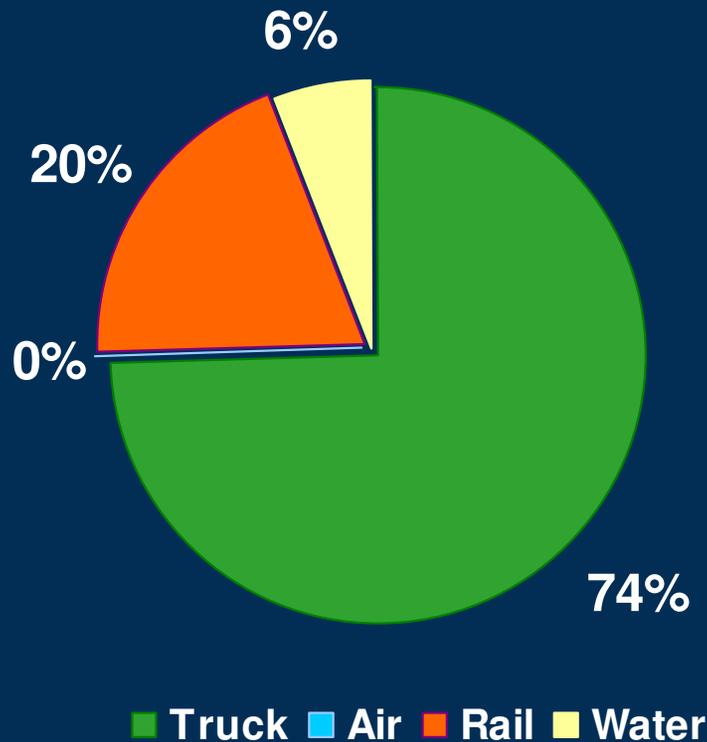


Source: TRANSEARCH 2004.

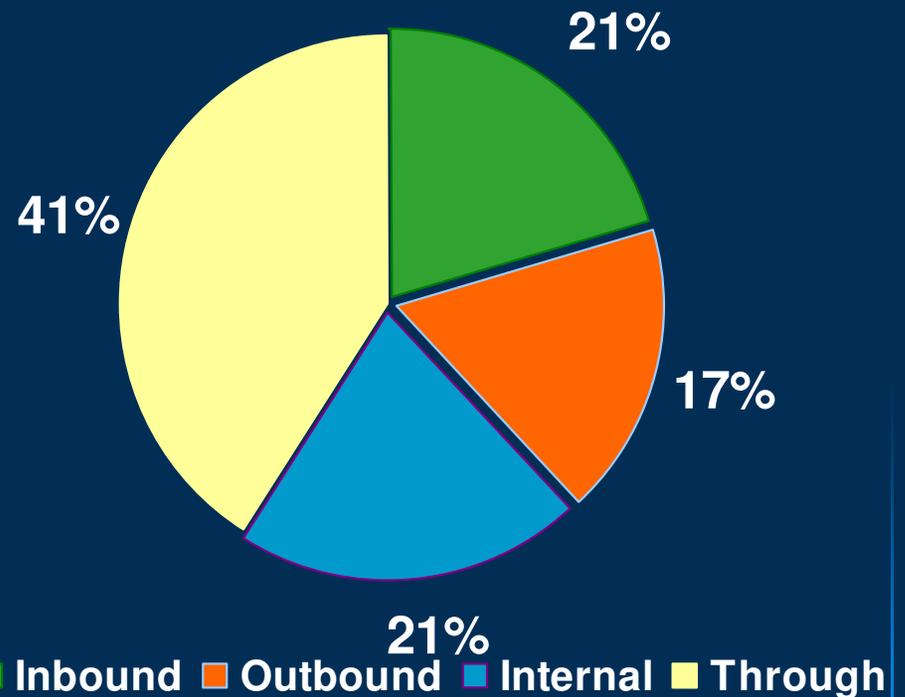
Commodity Flow Analysis Summary: Modal and Directional Splits by Weight for Virginia

Total Tonnage by Mode and Direction, 2004

Mode Split (tonnage)

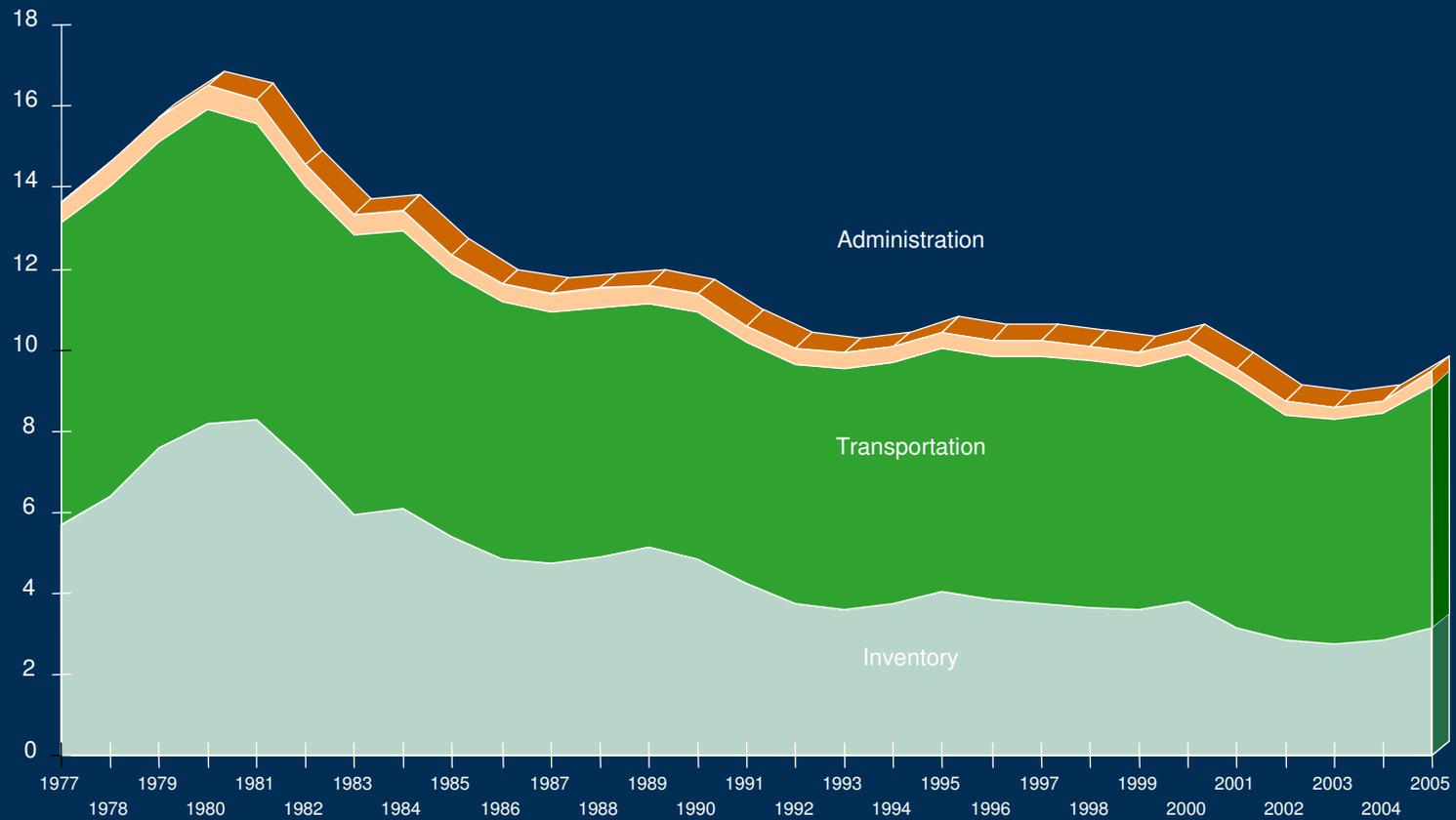


Tonnage Split (direction)



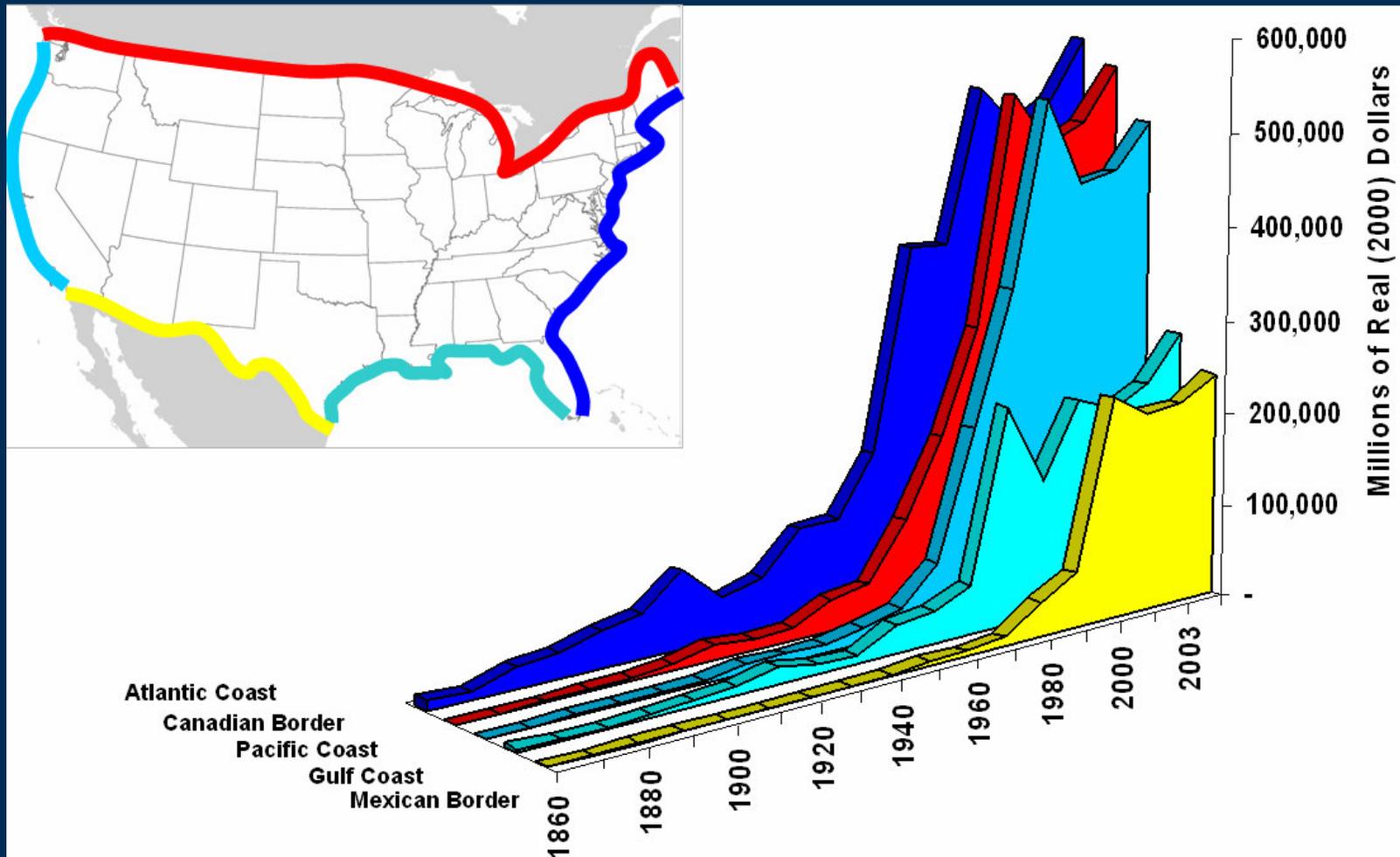
Total Logistics Cost

U.S. Gross Domestic Product (in Percent)



Source: Rosalyn A. Wilson, *State of Logistics Report*, Council of Logistics Management, 2006

21st Century Information Era/Globalization



NAFTA Freight Regions and Emerging Ports

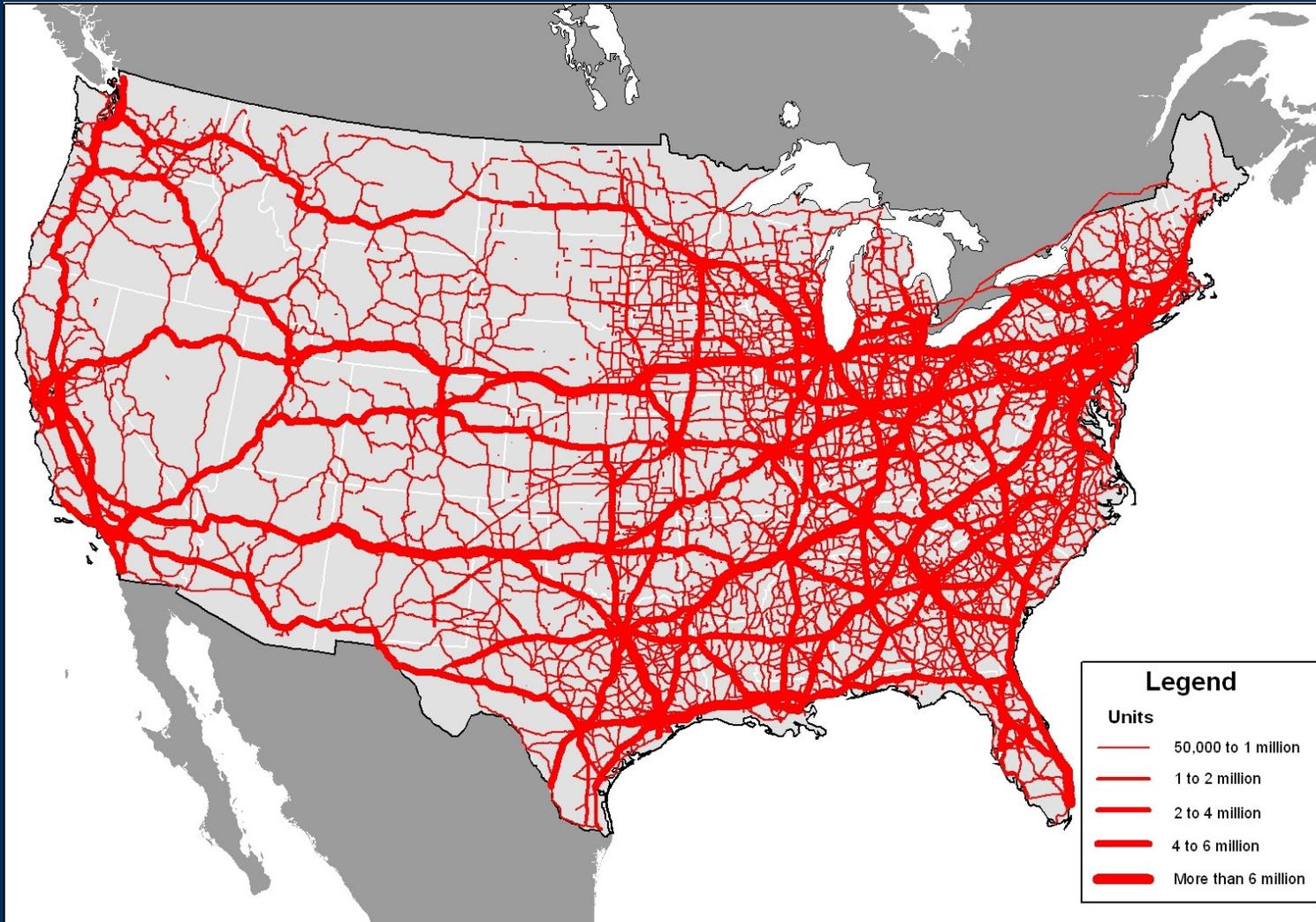
Principal Mexican Manufacturing Regions

- BAJA
- SONORA – PACIFIC
- CENTRAL MEXICO
- RIO GRANDE VALLEY
- CHIHUAHUA

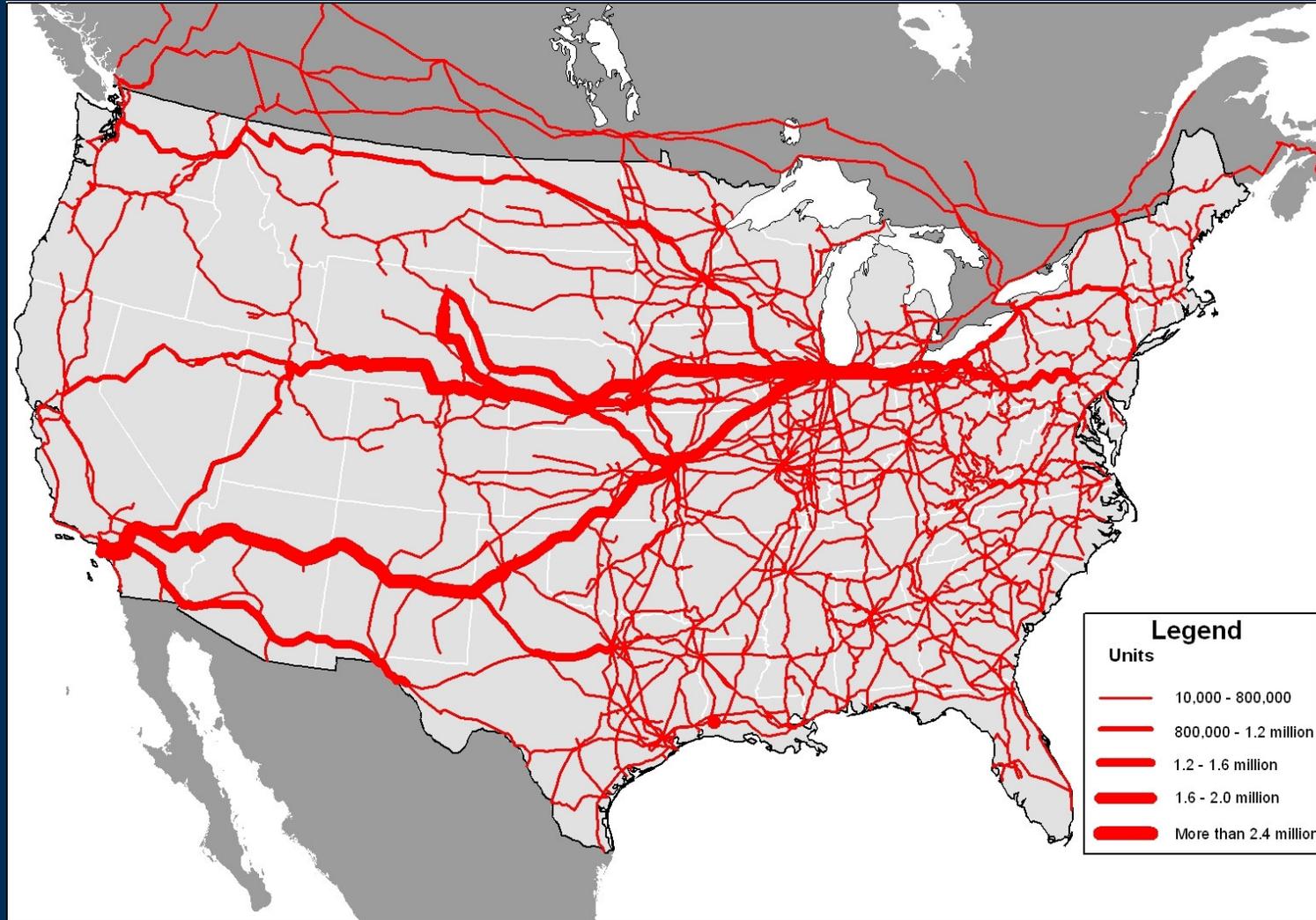


- US Ports of Entry
- Maquiladora Clusters
- ▲ Ports and Emerging Ports

Freight-Highway Traffic (Units, 2005)



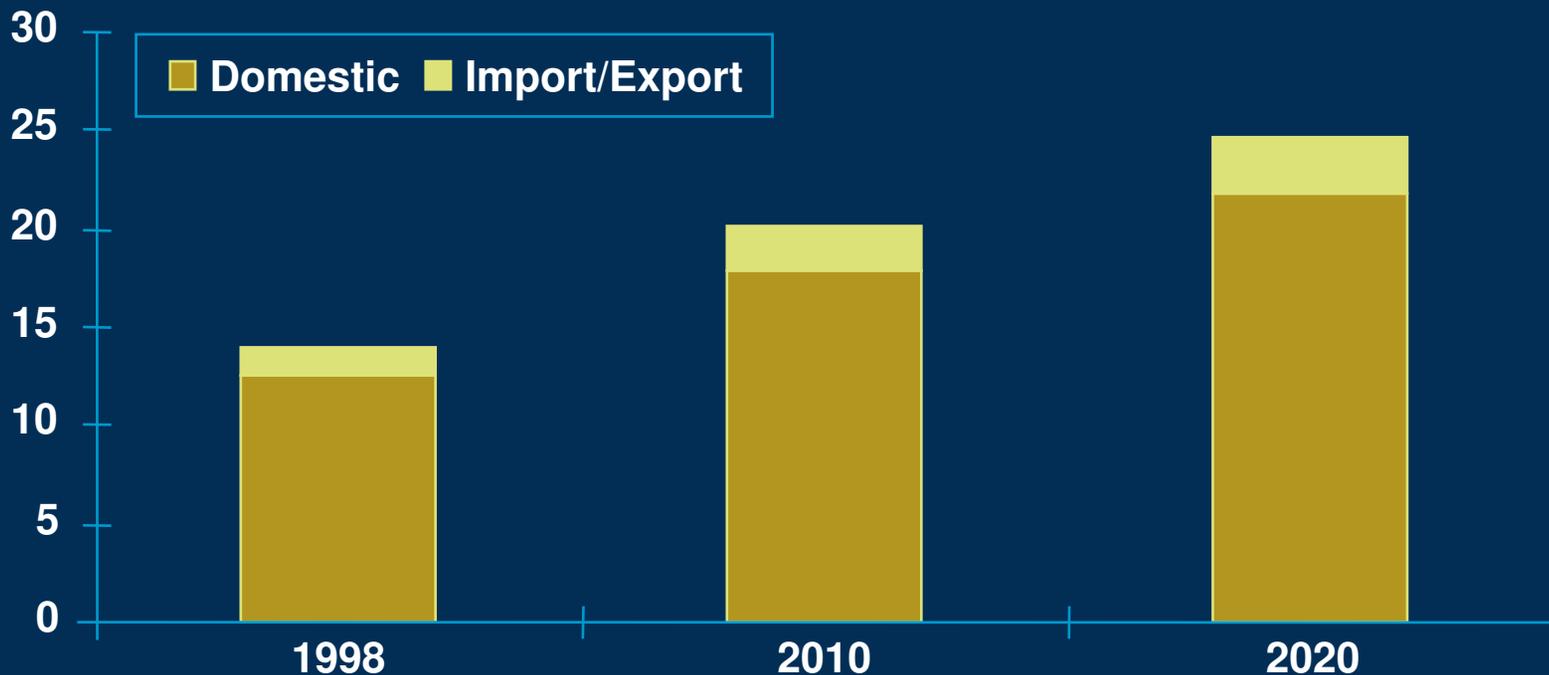
Freight-Rail Traffic (Units, 2005)



U.S. Freight Tonnage Forecast 1998 to 2020

- With moderate economic growth (3% per year), import / export freight tonnage could double and domestic freight tonnage could increase by about 60%

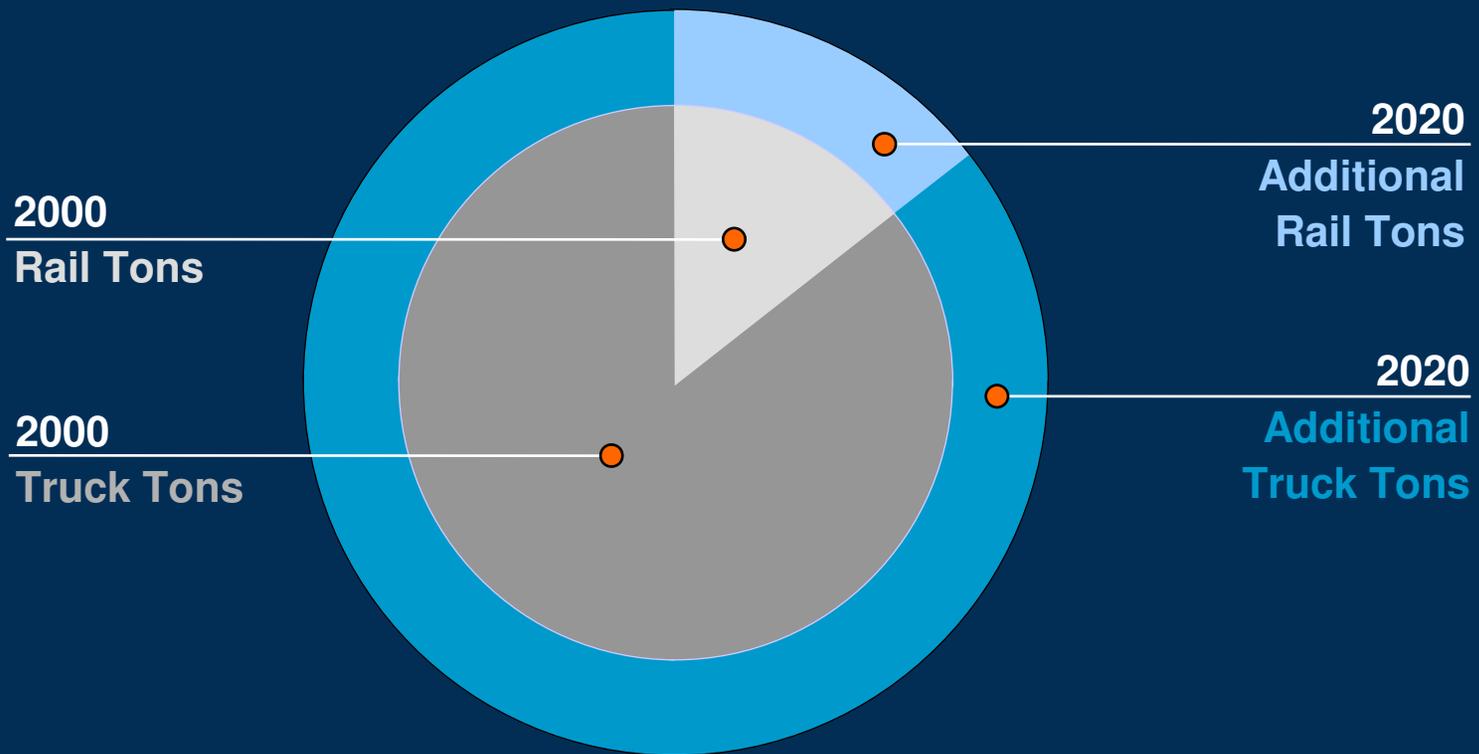
Freight Tons (in Billions)



Source: AASHTO *Freight-Rail Bottom Line Report*, 2003 (prepared by Cambridge Systematics, Inc.)

Freight System Capacity

Do the truck and rail freight systems have the capacity to handle the growing volume of freight – even if mode shares remain constant?



Do the public benefits of a freight-rail system warrant public initiatives to expand freight capacity?

Truck Movements by Weight: All Directions (In + Out + Intra + Through), 2004



Truck Movements by Weight: All Directions (In + Out + Intra + Through), 2030



Rail Movements by Weight: All Directions (In + Out + Intra + Through), 2004



Rail Movements by Weight: All Directions (In + Out + Intra + Through), 2030



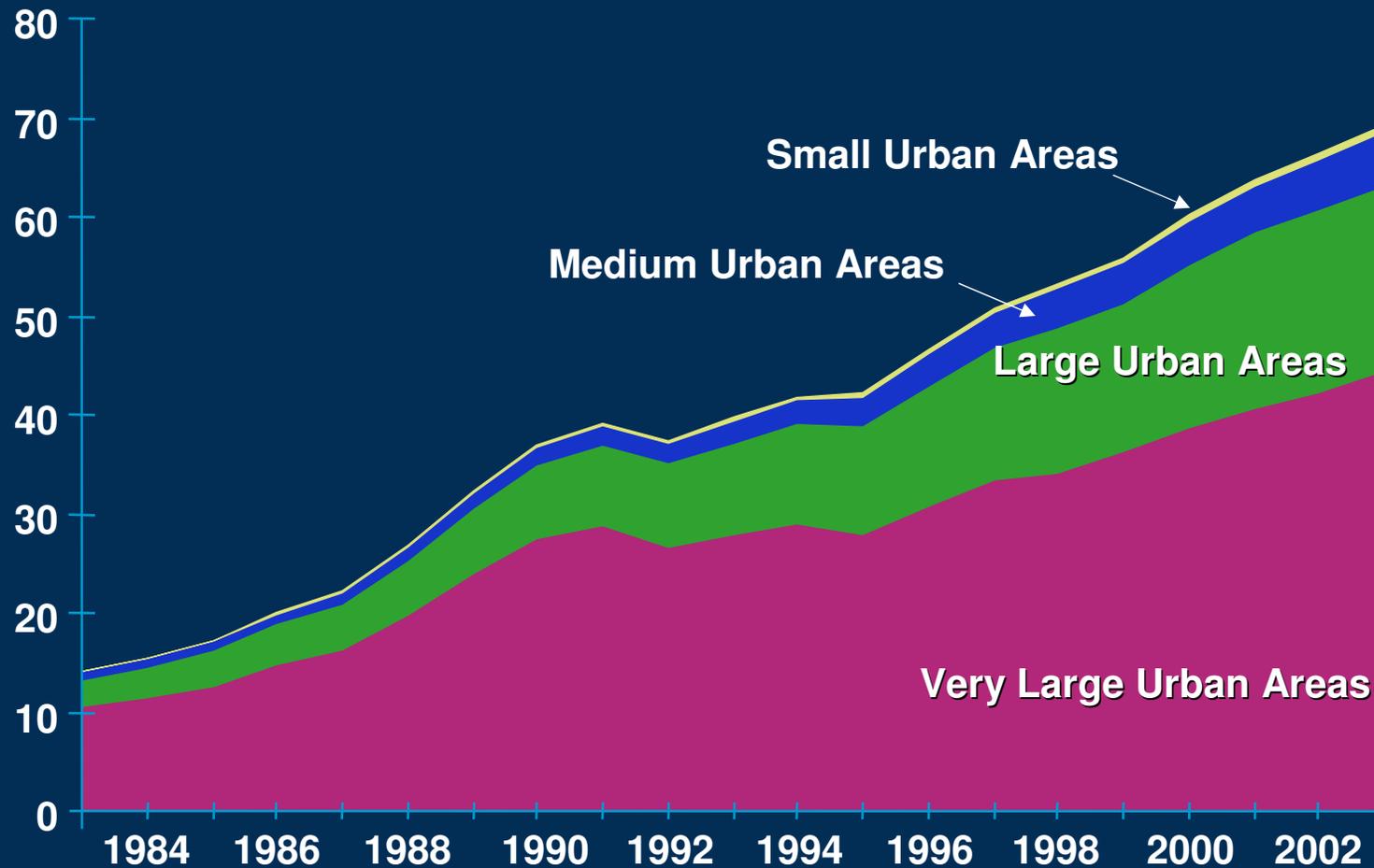
Increasing congestion

Vehicle travel up 78%; road miles increased 1% and lane miles 2% in last 20 years



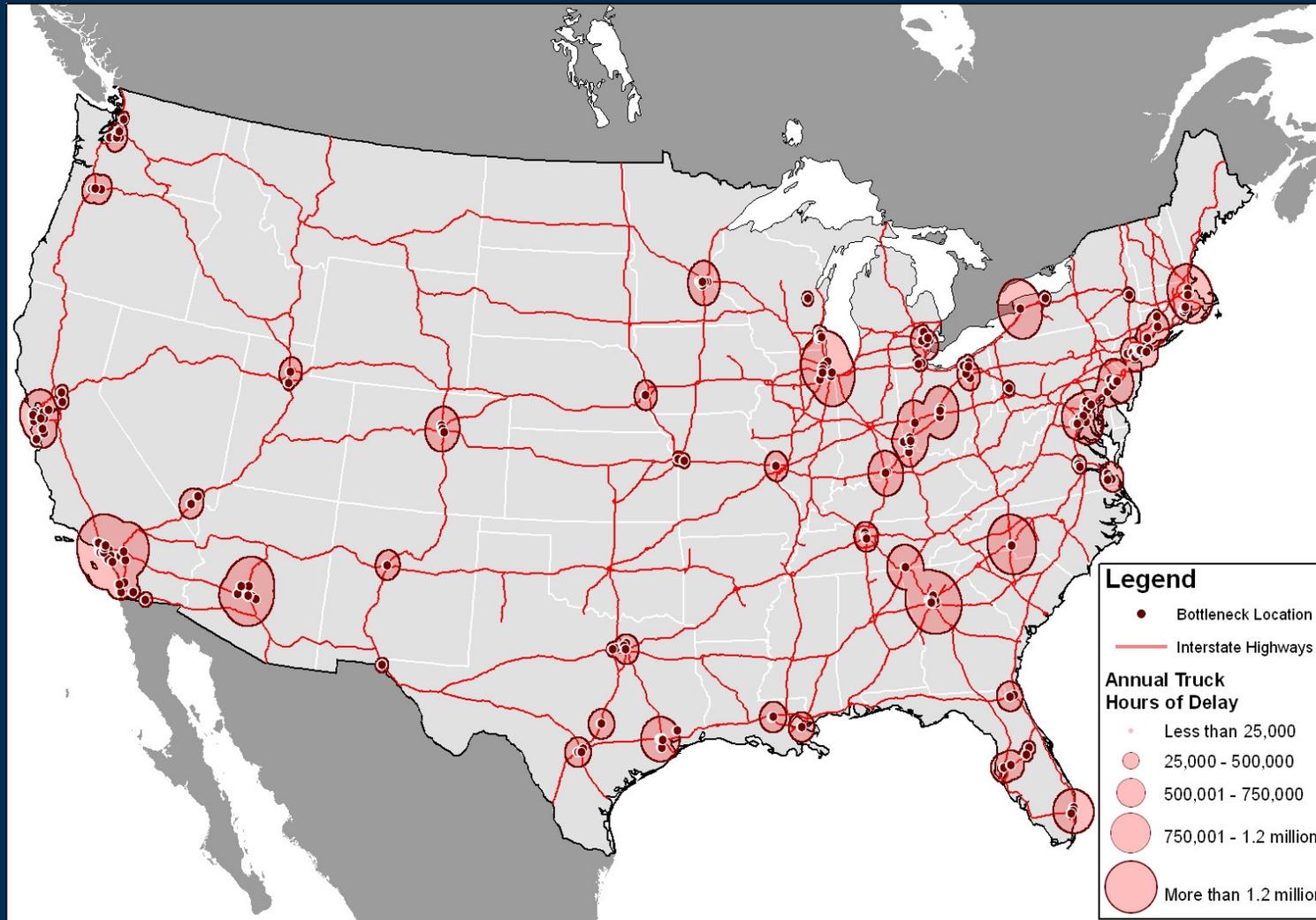
Annual Congestion Costs 85 Metropolitan Areas

Annual Costs (in Billions of 2002 Dollars)

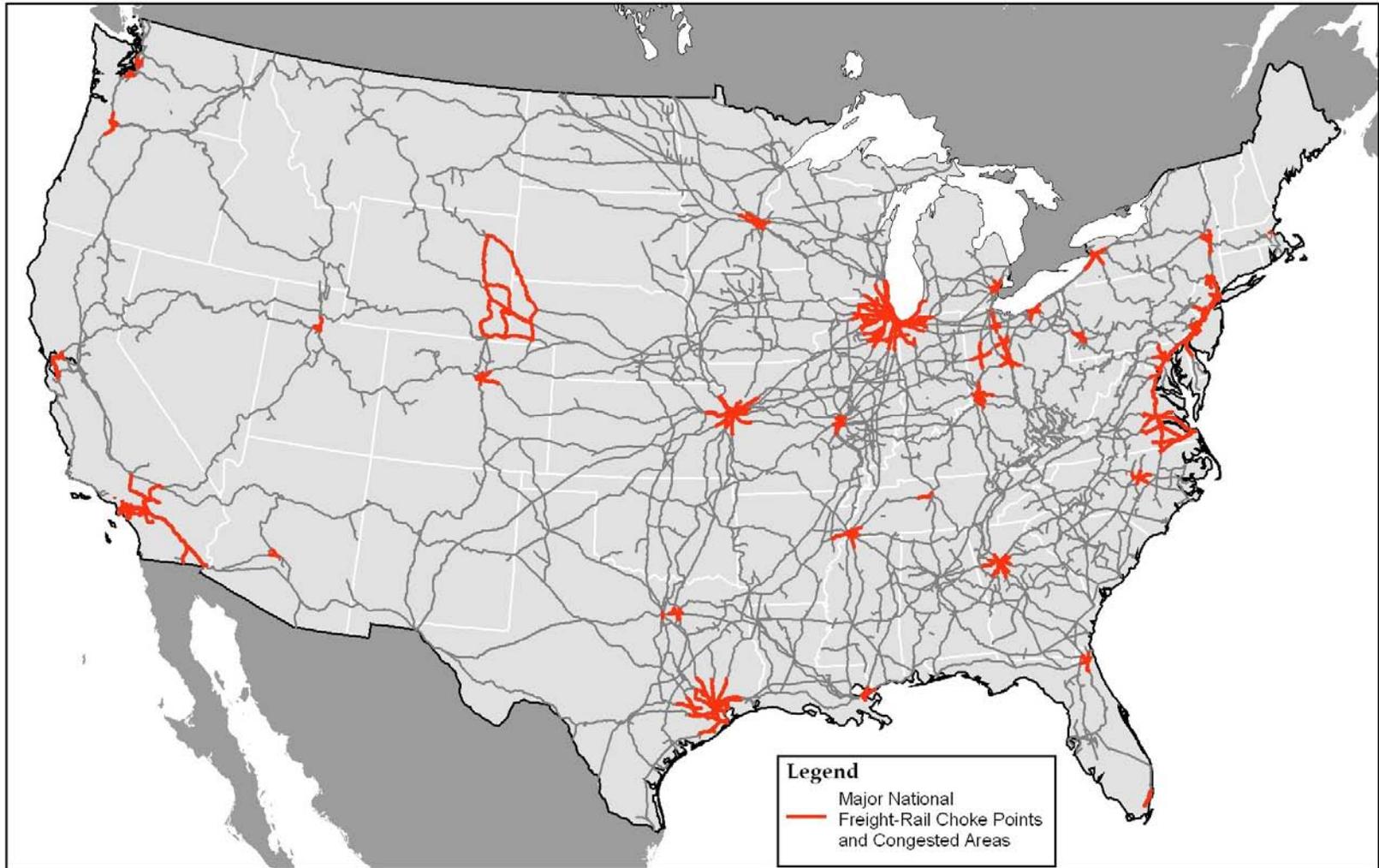


Source: Based on data reported by Texas Transportation Institute (TTI).

Truck Congestion Bottlenecks

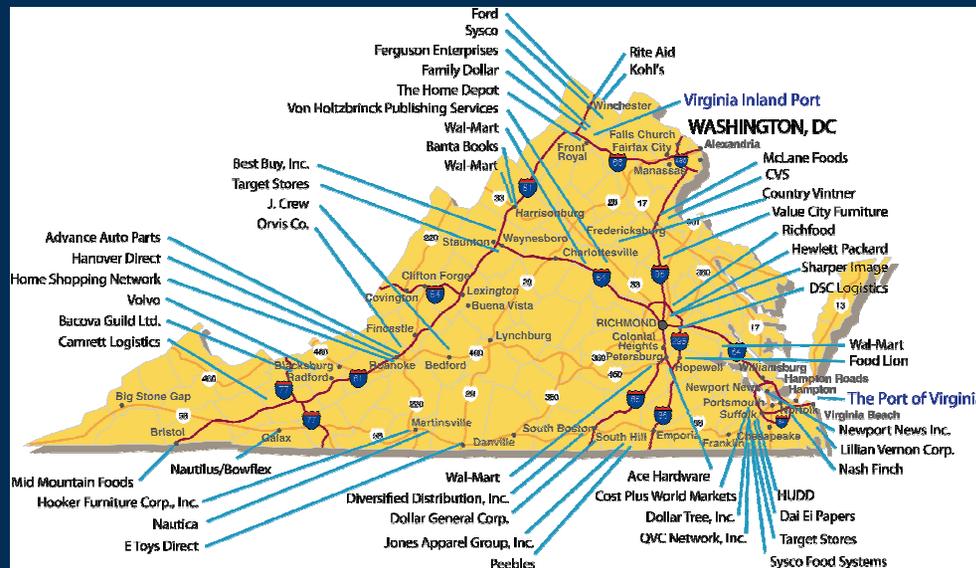
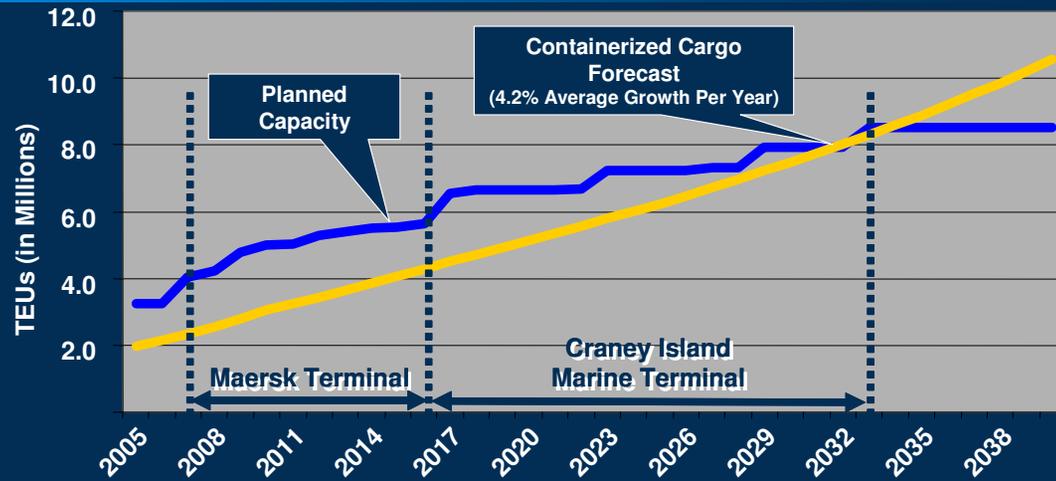


U.S. Rail Network Major Choke Points



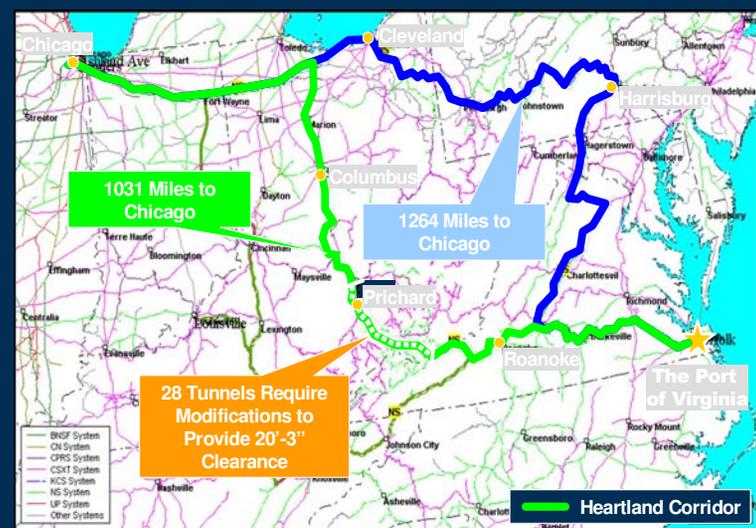
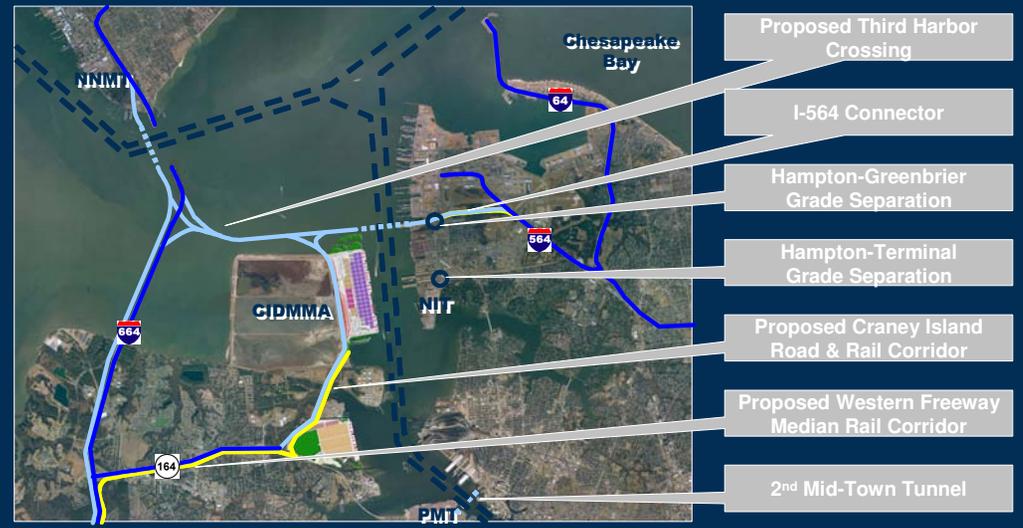
Ports and Growth

- Freight forecast model developed for Port Master Plan
- Linkage of port growth and warehouse/distribution center growth



Ports and Rail/Highway Connections

- Bottlenecks and solutions
 - International gateways
 - National corridors
 - Local connectors



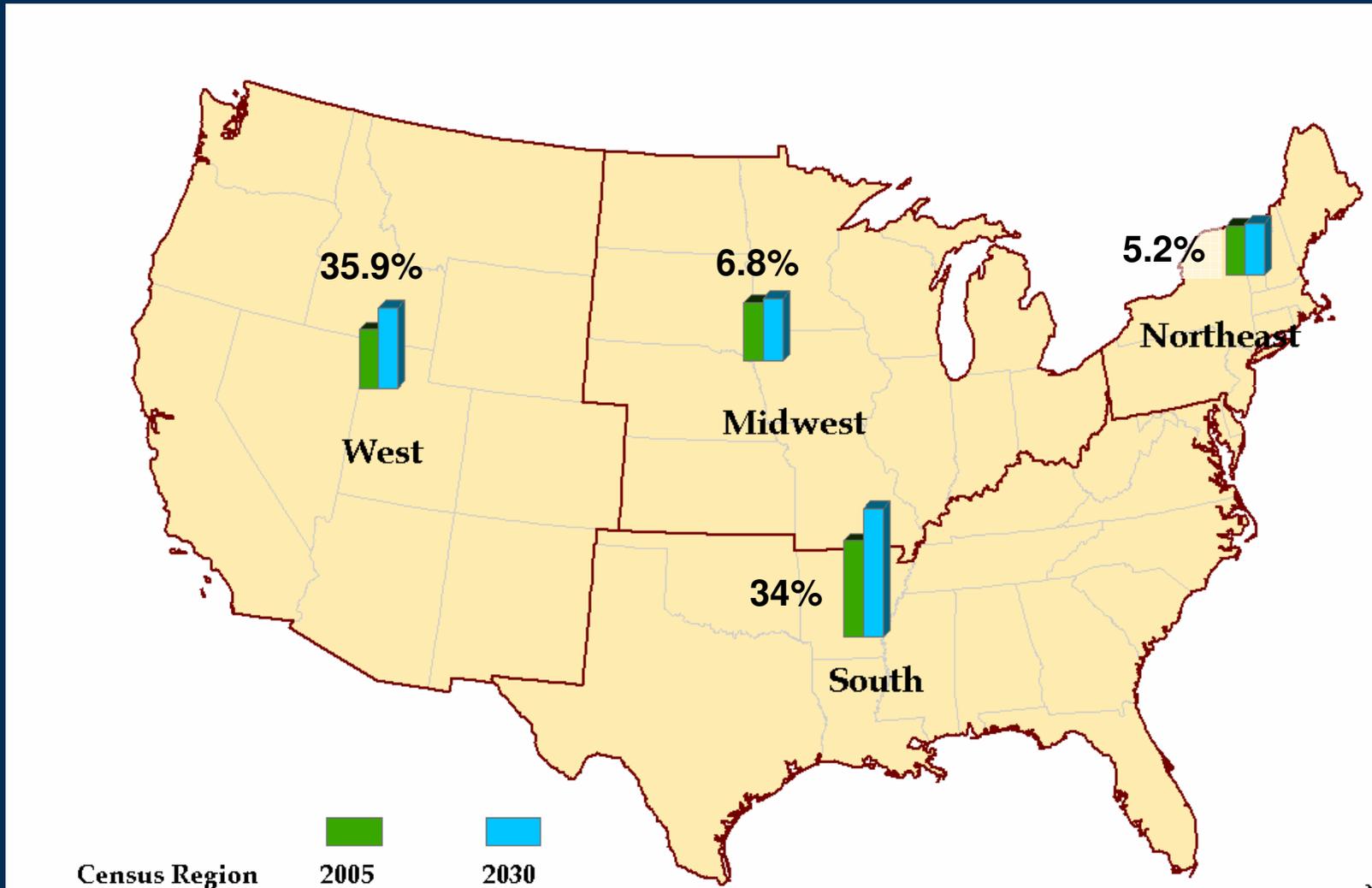
Other Issues and Challenges

- **Demographics**
- **Energy and the Environment**
- **System Operations and Safety**
- **Institutional Change**
- **Funding**

Demographics

- **Population Growth**
- **Aging**
- **Migration**

Census Region Population Forecast 2005-2030

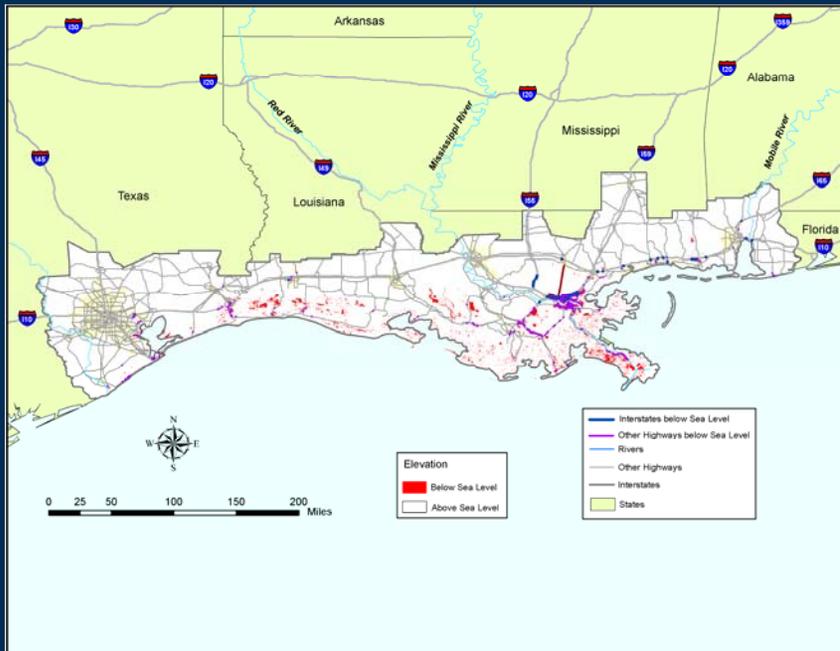


Energy and Environment

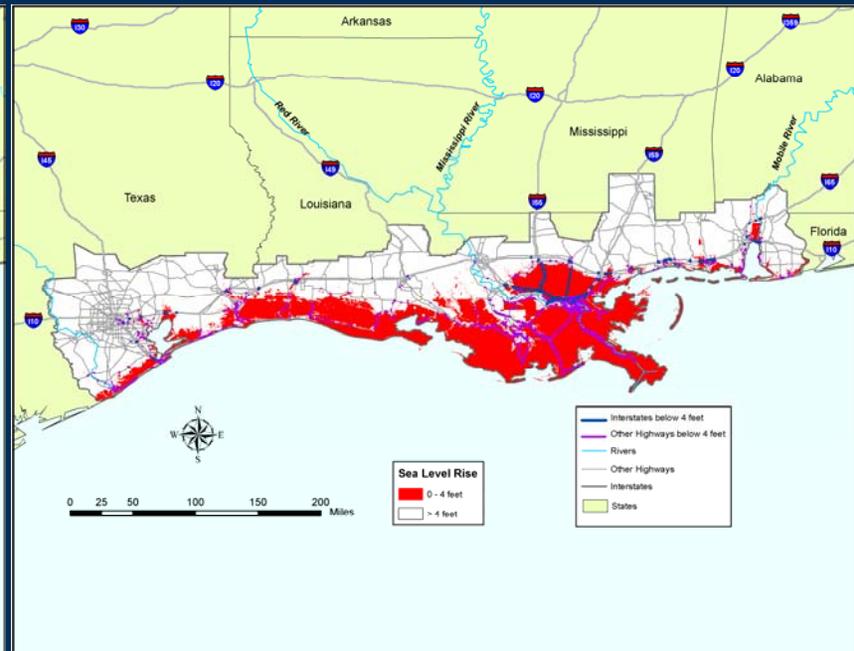
- **Shift from project impacts to systems (ecosystems) analysis**
- **Emerging Issues: air toxics**
- **Transportation/LU and public health**
- **Energy: price, alternative fuels, implications for finance strategies and environmental policy...**
- **Climate Change**

Highways Potentially Vulnerable to Sea Level Rise (DOT / USGS Gulf Coast Study – preliminary findings)

Baseline (Present Day)



4 Feet of Sea Level Rise



Source: Cambridge Systematics analysis of U.S. DOT Data.

Hurricane Katrina Damage to Highway 90 at Bay St. Louis, MS



Source: NASA Remote Sensing Tutorial.

System Operations and Safety

- Imperative to maximize efficiency of existing system will continue to increase
- VII, Smart Roadside, open-road tolling and pricing, real time traffic management and.....even signal timing!
- Security vs. capacity at international gateways
- Safety: vehicle and roadside technology and the engineering “E” a given; political will to match international progress with all the “E’s” unclear

Institutional Change

- **Shifting roles federal/state/regional**
- **Public and private roles and experimentation**
- **State CEO's and the "Mobility Corporation"**
- **Recognizing need for stronger partnerships**
- **Skill building and retention**

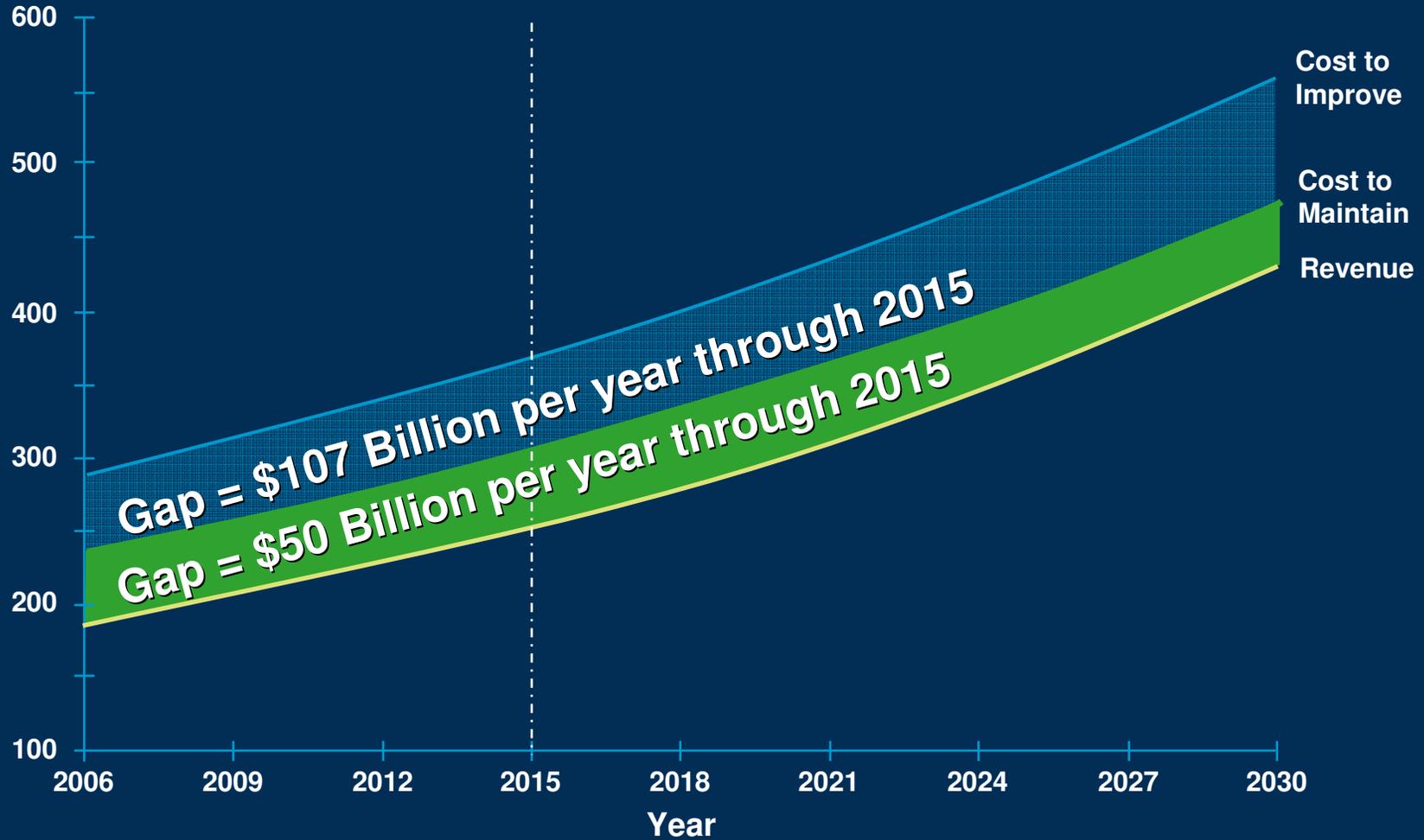
Funding

**Is There Really a Case for
More Funding?**

**At What Level of Government
Can the Case be Made?**

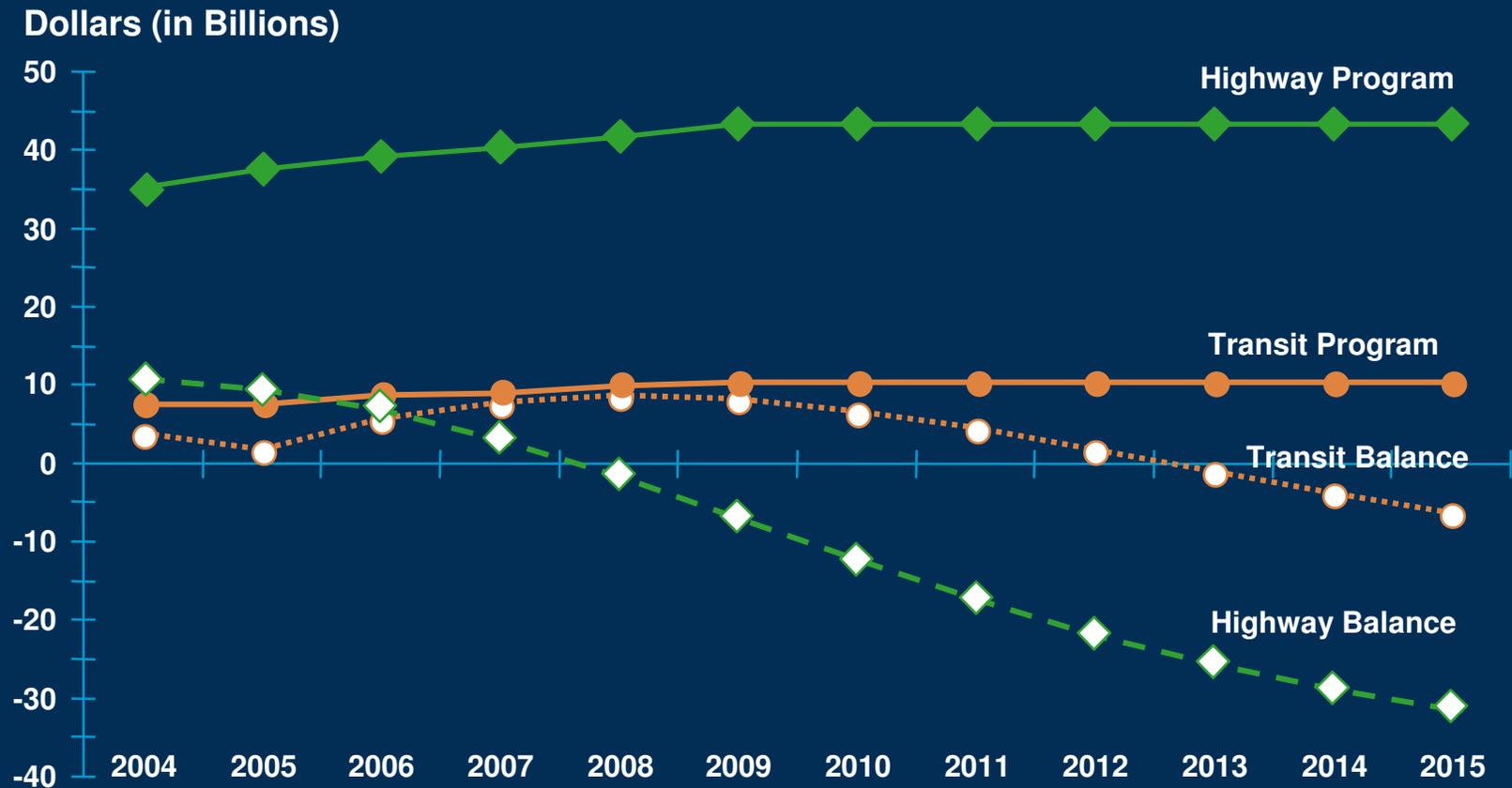
National Funding Gap

Year-of-Expenditure Dollars (in Billions)



Estimated Highway and Transit Program Levels and HTF Account Balances

Assuming Level Funding After 2009



The Case for Investments is Strong

- **Transportation as key economic driver**
- **Implications of new logistics and globalization**
- **Trends in system conditions and demand forecasts**
- **Historic rates of return 30% → 15%**
- **Cost of deferred maintenance well known**

Where's the Money?

- **Federal/National**

- **No system vision / goals to replace interstate**
- **Donor / donee debate**
- **Earmarking**
- **Potential shifts in public / private roles**
- **Impact of the Commission**

Where's the Money? (continued)

- **State / Regional / Local**
 - 26 of 34 (76%) transportation funding ballot initiatives passed in November 2004
 - At least ten states actively pursuing significant increases
 - Performance and accountability are key themes
 - Addressing freight and national economic issues difficult at this level
- **Wide range of mechanisms being examined including tolling and PPP's**
- **Transition from fuel tax to other mechanisms possible/likely in a 15/20 year horizon**

Conclusions

- **Passenger and freight demands on the transportation system will continue to grow**
- **West and south, gateways and bottlenecks on all modes will be key focus**
- **Demographic, environmental and energy issues will affect the strategies that will be effective**
- **Opportunities created by technology innovation will cut across many issues including system operations, safety, financing strategies, and security**
- **Strong national leadership will continue to be a critical element though significant institutional change is likely**